Part A. PERSONAL INFORMATION

CV date	[redacted]

First and Family name	**Dario Del Moro**		
Social Security, Passport, ID number	[redacted]	[redacted]	[redacted]
Researcher codes	WoS (Researcher ID)		
	SCOPUS (Author ID)	6603324865	
	Open Researcher and Contributor ID (ORCID) *	0000-0003-2500-5054	

A.1. Current position

Name of University/Institution	University of Rome Tor Vergata		
Department	Department of Physics		
Address and Country	Via della Ricerca Scientifica 1, 00133,Rome, Italy		
Phone number		E-mail	delmoro@roma2.infn.it
Current position	Assistant Professor	From	01/10/2008
Key words	Solar Physics, Space Science, Instrumentation		

A.2. Education

PhD	University	Year
Astronomy	University of Rome Tor Vergata	2005

A.2.1 Known Languages

	Spoken: proficiency level	Written proficiency level
Italian	5/5	5/5
English	4/5	4/5
Spanish	4/5	4/5

A.3. Articles, H Index, thesis supervised…

From Scopus:

- H index: 18
- Peer-reviewed articles: 91
- Total citations: 781

From NASA-ADS:

- H index: 19
- Peer-reviewed articles: 66
- Total citations: 526

From Scholar:

- H index: 21
- Peer-reviewed articles: 65
- Total citations: 1279

Tutor or Co-tutor of 6 PhD theses
Tutor of 4 Master theses
Tutor of 4 Bachelor theses

Part B. CV SUMMARY

I am interested in several different but closely related research fields. Here follows the list of the main topics, which are expanded below.

- **Dynamics of the solar atmosphere**
- **Digital Data Analysis and Processing**
- **Opto-electronic systems**
- **Space Science and Space Weather**
- **Machine Learning**

Dynamics of the solar atmosphere

The dynamics of the solar surface and the interaction with the magnetic structures control the external structure of the solar atmosphere, and more generally the entire heliosphere. The solar magnetic fields are produced and often organized by the motions of the solar plasma. Such movements organize the topology of the field from the photospheric to the coronal layers determining many of the physical properties of the solar atmosphere. In this context, I am involved in the study of the structures associated with convective motion of plasma and I have actively participated in: several projects funded within the FP7 and H2020 frameworks (EST, SOLARNET, GREST, PRE-EST, SOLARNET2); the ASI (Italian Space Agency) feasibility study for the ADAHELI satellite; and several PRIN (Italian National Research Grants) projects financed by MIUR or INAF.

Digital Data Analysis and processing:

The Earth atmospheric turbulence degrades the spatial resolution of images acquired by telescopes. I am interested in the study and application of strategies to reduce such an effect. In particular, for the part of post-acquisition restoring, I have included the MFBD (Multi-Frame Blind Deconvolution) algorithm in the IBIS data calibration pipeline. Also, in order to estimate the compression efficiency in the case of solar images, I have participated in a study of the propagation of compression artefacts in the data reduction pipeline and in MFBD restoration process. In the H2020 ESCAPE project I am participating in the design and implementation of Machine Learning algorithms, based on Convolutional Neural Network, to predict the solar wind conditions at L1.

Opto-electronic systems:

As part of the EST project financed by EU in both FP7 and H2020, I am involved in the wave front reconstruction from the information acquired by Shack-Hartmann-type sensors. Also, I estimated the performance of the multi-conjugate adaptive optics system designed for the telescope using the LOST simulation package. At present, I am working on the implementation of a prototype Fabry-Perot interferometer and a novel implementation of its control electronics.

Space Science and Space Weather

The Sun is the primary source of energy for our planet. It defines the physical condition in the heliosphere and therefore in the near Earth space, and is the main driver for the Earth climate. The knowledge of the environmental conditions in space, with particular attention to the variation of the plasma, of the magnetic field and of the radiation flux is called Space Weather. In the latest years, I applied myself to the observation of Space Weather events and in the development and testing of now- and fore-cast algorithms. In this field, I have actively participated in: the SPARC and IPS projects funded by the EU; the SWERTO project financed by FILAS-Regione Lazio; and the ”Space Weather Italian Collaboration” project financed by MIUR.

Machine Learning

In the last years, Machine learning approaches have been largely applied to exploite the unique combination of big data availability and relatively cheap computing power

Methods, algorithms, and statistical tools, studied and designed during the last two decades (and sometimes forgotten), have produced unexpectedly good results in Astrophysics and Geosciences. I employ state-of-the-art applications of machine learning to the space weather problem, in particular to solar flares and Coronal Mass Ejection forecast.

In this field, I have actively participated in: the ESCAPE and the SWATNET projects funded by EU in the H2020 framework.

Part C. RELEVANT RESEARCH INFO

C.1. Latest Publications

Stangalini, M. et al. 2021, *Torsional oscillations within a magnetic pore in the solar photosphere*, Nature Astronomy. DOI: 10.1038/s41550-021-01354-8

Forte, R. et al. 2020, *Data reduction pipeline for MOF-based synoptic telescopes*. Journal of Space Weather and Space Climate, 10. DOI: 10.1051/swsc/2020065

Giannattasio, F. et al. 2020, *Magnetic Energy Balance in the Quiet Sun on Supergranular Spatial and Temporal Scales*, ApJ, 904(1), 7, DOI: 10.3847/1538-4357/abbb36

Giovannelli L., et al. 2020, *The Tor Vergata Synoptic Solar Telescope (TSST): A robotic, compact facility for solar full disk imaging*, Journal of Space Weather and Space Climate, 10, 58, DOI: 10.1051/swsc/2020061

Viavattene G., et al. 2020, *Testing the Steady-State Fluctuation Relation in the Solar Photospheric Convection*, Entropy, 22(7), 716, DOI: 10.3390/e22070716

Piersanti, M. et al. 2020*, From the Sun to Earth: effects of the 25 August 2018 geomagnetic storm,* Annales Geophysicae, 38 703, DOI: 10.5194/angeo-38-703-2020

Abbasvand V., et al. 2020, *Chromospheric Heating by Acoustic Waves Compared to Radiative Cooling. II. Revised Grid of Models*, ApJ, 809(1), 22, DOI: 10.3847/1538-4357/ab665f

Keys P.H., et al. 2020, *High-resolution spectropolarimetric observations of the temporal evolution of magnetic fields in photospheric bright*, A&A, 633, A60 DOI: 10.1051/0004-6361/201936545

Vedakke Vettil S., et al. 2019, *The ionosphere prediction service prototype for GNSS users*, Journal of Space Weather and Space Climate, 9, A41, DOI: 10.1051/swsc/2019038

Keys P.H., et al. 2019, *The magnetic properties of photospheric magnetic bright points with high-resolution spectropolarimetry,* MNRAS, 488, L53, DOI: 10.1093/mnrasl/slz097

Giannattasio, F. et al. 2019, *The Complex Nature of Magnetic Element Transport in the Quiet Sun: The Lévy-walk Character*, ApJ, 878(1), 33, DOI: 10.3847/1538-4357/ab1be2

Del Moro D., et al. 2018, *Forecasting the 2018 February 12th CME propagation with the P-DBM model: a fast warning procedure*, Annals of Geophysics 61: 67, DOI:10.4401/ag-7750

Stangalini, M., et al. 2018, *Propagating Spectropolarimetric Disturbances in a Large Sunspot*, ApJ, 869(2), 110, DOI: 10.3847/1538-4357/aaec7b

Giannattasio, F. et al. 2018, *Occurrence and persistence of magnetic elements in the quiet Sun*, A&A, 611, A56, DOI: 10.1051/0004-6361/201730583

Napoletano G., et al. 2018, *A probabilistic approach to the drag-based model*, Journal of Space Weather and Space Climate, Volume 8, A11, 10 pp., DOI: 10.1051/swsc/2018003

Stangalini, M., et al. 2017, *Speckle statistics in adaptive optics images at visible wavelengths*, JATIS, 3, 025001, DOI: 10.1117/1.JATIS.3.2.025001

Piersanti M., et al. 2017, *Comprehensive Analysis of the Geoeffective Solar Event of 21 June 2015: Effects on the Magnetosphere, Plasmasphere, and Ionosphere Systems*, Solar Physics, 292, 11, 169, DOI: 10.1007/s11207-017-1186-0

Lovric M., et al. 2017, *The dependence of the [FUV-MUV] colour on solar cycle*, JSWSC, Volume 7, A6, DOI: 10.1051/swsc/2017001

Del Moro D., et al. 2017, *JP3D compression of solar data-cubes: Photospheric imaging and spectropolarimetry*, Experimental Astronomy, Volume 43, Issue 1, DOI: 10.1007/s10686-016-9518-x

C.2. Research projects and grants

Local Coordinator or Head of the Research Unit in the following grants:

EU/H2020 INFRAEOSC-2018-02 ”ESCAPE: European Science Cluster of Astronomy & Particle physics ESFRI research infrastructures”

EU/H2020 MSCA-ITN-2020 “SWATNET: Space Weather Awareness Training Network”

Member or Leader of working group in the following grants:

MIUR-PRIN 2017APKP7T ”CEI6: Circumterrestrial Environment: Impact of Sun-Earth Interaction”

EU/H2020 INFRAIA-2018-1 ”SOLARNET 2 - High-Resolution Solar Physics Network”

EU/H2020 INFRADEV-2016-2 ”PRE-EST: EST Preparatory Phase”

EC 434/PP/GRO/RCH/15/8381 ”IPS - Ionospheric Prediction Services”

FILAS-RU-2014-1028 ”Banca dati di Space Weather da strumenti nello spazio ed a Terra”

EU/H2020 INFRA-2014 ”GREST - Getting Ready for EST”

EU/FP7 INFRA-2012 ”SOLARNET - High-Resolution Solar Physics Network”

MIUR-PRIN 2012P2HRCR ”The active Sun and its effects on Space and Earth climate”

EU/FP7 CIPS-2011 ”SPARC - SPace AwaReness for Critical infrastructures”

EU/H2020 EMJMD-2010 “ASTROMUNDUS: Erasmus Mundus Master Course in Astronomy and Astrophysics”

EU/FP7 INFRA-2007 ”EST - The large aperture European Solar Telescope”

ASI-Small Mission Phase A study ”ADAHELI - ADvanced Astronomy for HELIophysics”

2003-2004 CNR Research Fellow ”Computational methods for solar photospheric structures characterization”
2005-2006 University of Rome Tor Vergata Research Grant ”Study of convective structures observed on the solar surface”

C.3 Memberships of scientific societies:

- INAF associated scientist
- Società Astronomica Italiana
- European Physical Society
- European Geophysical Society
- SWICO, Space Weather Italian Community
- ESF and MiUR Pool of Referees (Astrophysics: sun and planets)

Part D. RELEVANT DIDACTIC INFO

D.1 Courses

Lecturer of:

Space Science for AA 2020/2021

Big Data, Machine Learning and Astrophysical data-sets for AA 2020/2021

Astrophysics Laboratory for AA 2020/2021

Digital Data Analysis from AA 2017/2018 to present day

Fisica Solare Sperimentale from AA 2009/2010 to AA 2015/2016

Laboratorio Di Astrofisica 2 from AA 2006/2007 to AA 2012/2013

Assistant to:

Laboratorio di Calcolo Numerico ed Informatica from AA 2006/2007 to present day

D.2 Exam commission

Also Member of the exam commissions on:

Sun and Space Climatology

Fisica dei Plasmi

D.3 Institutional responsibilities

- Didactic Committee of the Physics Department
- Joint Student-Staff Committee of the Physics Department
- Executive Committee of the Physics Department
- Astromundus Erasmus Mundus Masters Course Quality Committee

Public Outreach activities in the past 5 years

In the past 5 years, DDM organized and participated to a number of very successful events open to the students, the media and the general public.
- public event during the solar eclipse on March 20, 2015
- public event for the 50th anniversary of the Apollo 11 mission launch on July 16, 2019
- public event during the Mercury Transit November 11, 2019
Those events had a large participation from the public, were streamed live (e.g. link at https://www.youtube.com/watch?v=STGwPQxdHUQ) and had an important media coverage.

Every year, DDM organize and participate to the “A night at the University” event, a nighttime observation experience open to local students and to the public from the neighborhood.

DDM held the “Pint of Science Talk” on the 2018 national edition of “Pint of Science”.

DDM participated to the 2018 Rome edition of the Maker Faire, presenting the prototypes of the instruments for the European Solar Telescope.

DDM has been actively participating in the many activities supported by the MIUR Piano Lauree Scientifiche project in the University of “Tor Vergata”, such as the Stage@TorVergata since 2010.